

## **Mineral Resource Facts**

by Robert M. McKay

The following economic minerals have been produced or explored for in Iowa:

### ***Construction Industry Resources***

#### **Clay and Shale**

Clay and shale are produced in Iowa for use in Portland cement, lightweight aggregate, common bricks, and for the ceramics industry, including floor and wall tiles and pottery. Clay is currently being produced from eight pits in Iowa by six companies.

#### **Crushed Stone (limestone)**

Crushed stone is Iowa's leading mineral commodity, with a production of 38 million tons, valued at \$186 million, accounting for almost 50% of the state's mineral value. The major use of crushed stone is for road resurfacing, with the material also used in cement manufacturing, bituminous surface aggregate, agricultural limestone, and numerous other applications. Currently, only limestone and dolostone are crushed in Iowa.

#### **Dimension Stone**

Dimension stone (flagging, veneer, and quarry blocks) of limestone and dolostone is produced in Dubuque, Jackson, and Jones counties. In Jones County, quarries in the Stone City area have been producing dimension stone continuously since the 1880s. This high quality rock, called Anamosa Stone, is marketed throughout the midwest and as far as California.

#### **Gypsum**

In 1992 Iowa was the nation's second largest producer of gypsum, mining over 2 million tons valued at \$11.6 million. The two primary gypsum producing areas in Iowa are in Webster County, where it is produced from surface mines, and Des Moines County, where it is extracted from an underground mine. Gypsum's primary uses are for wallboard, plaster, and cement products.

#### **Sand and Gravel**

Sand and gravel resources represent one of Iowa's largest mineral industries. Over 16 million tons of sand and gravel, valued at over \$58 million, were marketed by Iowa producers in 1992. These resources are used primarily for maintenance of Iowa's road system, for concrete aggregate, and subgrade road material. Most of Iowa's mineable sand and gravel resources are stream-deposited sediments.

## ***Agricultural/Chemical Feedstock Industries Resources***

### **Lime: chemical feedstock, ag-lime, high-calcium limestone**

Lime (calcium oxide) both as quicklime and hydrated lime are manufactured in Scott County. It is produced by calcining (burning under controlled conditions) high calcium limestone to produce quicklime. Some of the quicklime is crushed and reacted with water to produce hydrated lime. Lime is used by the chemical industry in the production of paint and other products, and in other industries.

### **Peat**

Peat is an unconsolidated material composed of partially decomposed plant remains from a water-saturated environment such as a bog or fen. Total peat production in Iowa is small and limited to only a few sites. Last available production statistics for Iowa were 1988 when 15,000 tons was mined, valued at \$433,000. Peat is primarily used as a soil conditioner.

### **Phosphate**

Phosphate has never been produced in Iowa, however, the basal portion of the Ordovician-age Maquoketa Formation in portions of Dubuque County is moderately phosphatic. Although thin and currently subeconomic, this interval is a potential source of phosphatic material.

### **Silica Sand**

Iowa has extensive deposits of high purity, readily accessible silica sand. This resource is present almost exclusively in the St. Peter Sandstone (Ordovician) of northeastern Iowa. Most past production was from underground mines near the Mississippi River town of Clayton (Clayton County). Silica sand is used in the foundry, glass, and chemical industries.

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## ***Energy Resources***

### **Coal**

Iowa's coal resources have been estimated conservatively at 7.2 billion tons. Other estimates based on less rigorous criteria range as high as 29.6 billion tons. All menial coal is Pennsylvanian-aged occurring in the Cherokee, Marmot, and Wabaunsee groups ([click to view nomenclature for Pennsylvanian System of Iowa](#)) with an average rank of high volatile C bituminous. The coal occurs in primarily nonmarine shales, sandstones, and siltstones with minor interbedded marine limestones and shales. The Cherokee Group coal beds themselves are characteristically variable in thickness and extent while the younger coal beds are more persistent. High sulfur and ash contents are common throughout. Historical production information is available.

### **Coalbed Methane**

Methane is a by-product of coalification that has been produced for fuel in many coal

bearing regions. Recently, "nonpetroleum" sources of natural gas have attracted interest due to changes in the tax laws on natural gas production. The gas is generated primarily in two phases during coalification; first when the plant material is initially buried and begins the process of anaerobic decay and later when the coal makes the transition from C bituminous to B bituminous. This latter change is brought about by continued application of heat and pressure, usually due to burial.

The extensive area of Pennsylvanian-age strata in Iowa includes significant coal resources. Much of these resources lie at depths in southwestern Iowa where economic mining is impossible. The coal in this area of the state and any associated methane are a largely unknown resource.

### **Oil and Gas**

Petroleum (oil and gas) is not currently produced in Iowa, and exploration activities in Iowa have been historically low (with only about 135 oil test wells drilled). Only two wells have produced oil in Iowa, the W.F. Flynn P-1 and the CST #1 Bombei, both drilled on the Keota Dome in Washington County, southeast Iowa. The total production from both wells was less than 500 barrels.

In addition to the southeast Iowa area, two other potential provinces in Iowa offer the hope of potential petroleum production. The Forest City Basin of southwestern Iowa and adjacent states has produced significant amounts of oil in Missouri and Kansas. Producing oil fields lie as close as 15 miles south of the Iowa border (at Tarkio, Missouri), but only traces have been discovered in Iowa. Black shales associated with the Precambrian age Midcontinent Rift System were the target of exploration in the mid to late 1980s. A deep test well, the M.G. Eischeid #1, was drilled in Carroll County in southwest Iowa in 1987 by Amoco Production Company. The well reached a total depth of 17,851 feet, the deepest penetration of Midcontinent Rift clastic rocks, but no petroleum detections were reported.

The Department Natural Resources administers Iowa's [oil, gas, and metallic minerals laws](#).

### **Uranium**

Uranium has never been mined in Iowa, however, in the mid 1980s a short-term exploration program was initiated in Lyon County in northwestern-most Iowa. This program targeted the base of the Precambrian Sioux Quartzite for Olympic Dam type deposits. Economic considerations halted activities before any exploration drilling was conducted. Elsewhere in Iowa, high uranium values are associated with Pennsylvanian black shales in southwest Iowa.

## ***Metallic Minerals***

### **Chromite**

Chromite has never been mined in Iowa, however, in late 1964, New Jersey Zinc drilled a series of exploration drill cores on an aeromagnetic anomaly in Sioux and Lyon counties in northwest Iowa. Later study of these cores revealed an altered Archean age layered mafic pluton that included a serpentinized zone with centimeter-thick chromite bands. Several exploration companies have subsequently restudied the cores but have determined that it was not an economic deposit. The drill cores are on file at the Iowa Geological Survey's Oakdale Rock Library.

### **Gold**

There are no outcroppings of gold-rich rocks in Iowa, however, gold is scattered in small amounts in some of the glacial materials that cover the state. The gold is concentrated in sands and gravels in many of Iowa's rivers where it can be recovered in small amounts by panning.

In 1853 an Eldora inn keeper named John Ellsworth reported a discovery of gold on his farm along the Iowa River in Hardin County. As news of the discovery leaked out, Iowa experienced its own gold rush. As many as 3,000 would-be miners descended on the Eldora area in search of instant wealth; all left disappointed.

In his 1904 report on the Geology of Fayette County, T.E. Savage stated that \$1.00 to \$1.50 worth of gold could be panned from Otter Creek in a day by a 'patient washer.' Today with the value of gold at about \$300 per ounce, that gold would be worth about \$25.

### **Iron**

Iowa's only historic iron production was from a Cretaceous-age sedimentary iron deposit called Iron Hill near Waukon in Allamakee County in northeast Iowa. The deposit was originally explored in the 1870s and first mined in 1899. The mine operated intermittently for 20 years between 1899 and 1918, and it is estimated that about 67,000 tons of iron ore concentrate was produced and shipped. Original reserve estimates of 10 - 12 million tons indicate that a substantial quantity of ore remains.

### **Lead and Zinc**

The first mineral extraction of lead and zinc in Iowa was probably before the year 1650 in the Dubuque area by early French voyageurs and Indians. These early prospectors mined metallic lead ores and initiated the lengthy history of mining of lead and zinc ore in Iowa until 1910 when the Avenue Top Mine, the last of the Dubuque area mines, was closed. Production figures for this lengthy mining period are nonexistent to very incomplete, however, lead production apparently peaked in 1848 and in 1854. A reported 4,385 tons of lead was exported from Dubuque. By 1910, the year the last mine ceased operation, combined annual production of lead and zinc concentrates had declined to 270 tons. The industry's last production in Iowa occurred between 1911 and 1917 when ore

concentrates, totaling less than 350 tons, were processed from remnant dumps and tailings piles.

### **Manganese**

Manganese has never been mined in Iowa, however, in the late 1980s a U.S. Geological Survey-sponsored exploration program was initiated around the Sioux (Quartzite) Ridge in South Dakota and Minnesota. Although no exploration was conducted in Iowa, this unit does extend into Lyon County, the northwestern-most Iowa county. This program targeted the Cretaceous rocks and Cannon-Force type sedimentary manganese deposits. A number of drill cores were obtained, but no significant manganese concentrations were discovered.

For additional information on mineral resources see [Information Services](#).